

Developing Different Solutions for Collision Avoidance Algorithms in Medium Altitude Air Systems

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The traffic collision avoidance system (TCAS) has a significant effect on reducing the risks of mid-altitude collisions. It is used despite the increasing air traffic and is used to prevent accidents and their destructive effects. Although TCAS offers an advantageous use with its high success rate, this success rate depends on the presence of this system in other aircraft. The solution proposal produced by the system is successful if TCAS is also present on the opposite aircraft, which poses a collision risk. If the opposite aircraft does not have this system, TCAS produces a solution proposal for the existing aircraft. However, it remains unknown whether the opposing aircraft will take any action that will increase the risk of collision during the implementation. Based on this motivation, in this article, it has been studied to bring a new capability to TCAS. In this study, it is aimed to increase the success rate of TCAS's solution proposals thanks to the newly added mode interrogators to the identification friend or foe (IFF) systems. As a result, the solution proposal produced by the aircraft with TCAS capability was transmitted to the other aircraft without TCAS capability thanks to this new add-on, and it was seen that the success of the solution was guaranteed.

Keywords: Collision Detection, Identification Friend or Foe, IFF Mode Codes, Traffic Alert and Collision Avoidance System

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